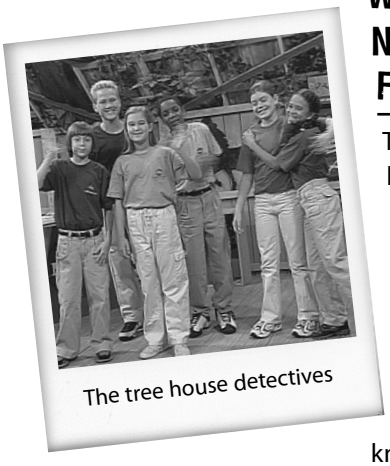
2001-2002 Series Overview

What is the NASA "Why?" Files?

The NASA "Why?" Files is an annual series of FREE integrated mathematics, science, and technology instructional distance learning programs that NASA Langley Research Center in Hampton, VA created for students in grades 3 - 5. The series uses problem-based learning (PBL) to introduce students to scientific inquiry while providing students the opportunity to solve real world problems with the help of community experts and NASA researchers.

The NASA "Why?" Files supports the teaching of national standards identified by the National Science Teachers Association (NSTA), the National Council of Teachers of Mathematics (NCTM), the International Society for Technology in Education (ISTE), the International Technology Education Association (ITEA), and the National Council for Geographic Education (NCGE). The series is a partnership that involves the following four organizations: (1) NASA Langley's Office of Education, (2) NASA Langley's Learning Technologies Project, (3) Hampton (VA) City Public Schools, and (4) Busch Gardens (Williamsburg, VA).


The tree house detectives

What is the NASA "Why?" Files all about?

The NASA "Why?" Files story lines are developed by educators and involve the exploits of six ethnically diverse, inquisitive children who are excited about mathematics, science, and technology. The tree house detectives, as they are known, meet in a tree house where they work together using problem-based learning and scientific inquiry to explore and solve "real-world" problems that occur in their community. To find solutions to these problems, they are guided by their mentor, Dr. D, a retired science teacher. NASA researchers, print and on-line resources, community experts, and students across the country who are members of the NASA "Why?" Files Kids Club also help with their investigations.

What are the components of the NASA "Why?" Files?

Each program in the series has three components designed as an integrated instructional package:

Television broadcast: Each 60-minute program is divided into four, 15-minute instructional segments that feature focus and extension questions. Content experts, experiments, museums, NASA researchers, classroom activities, and the NASA "Why?" Files Kids Club are included in every program. Each program is closed-captioned for the hearing impaired.

Educator Guide: Each guide includes a listing of the featured national mathematics, science, technology, and geography standards, a program overview, vocabulary, implementation strategy, activities, experiments and worksheets, related print and electronic resources, and career information.

Web Site: The web site is divided into teacher, parent, and student sections and features suggested usage, problem-based learning information and techniques, Dr. D's Lab, the Media Zone, Resource Rack, the Expert's Corner, Backstage, and the Problem Board.

How can I get the television broadcast?

There are five ways to receive the television broadcast and/or purchase a video program.

The NASA "Why?" Files programs are carried by PBS stations nationwide and on many Cable Access Channels. Check our web site, **http://whyfiles.larc.nasa.gov**, for local listings.

The programs are broadcast on Ku- and C-band satellite and can be downlinked by using the satellite coordinates listed on the NASA "Why?" Files web site.

Programs are available on the web through NASA's Learning Technologies Channel, **http://quest.arc.nasa.gov/ltc/special/whyfiles/whyfiles.html**.

You can obtain video copies of the broadcasts from the NASA Educator Resource Center in your state, **http://education.nasa.gov/ercn** (p. 7).

You may purchase the video copies from NASA CORE, Central Operation of Resources for Educators, **http://core.nasa.gov** (video series) (p. 7).

How much does it cost and how do I register?

The NASA "Why?" Files is FREE to educators. Registered educators receive, via E-mail, a reminder notice of upcoming shows, a program summary, and an educator guide. You can register for the series in one of four ways.

Electronically: http://whyfiles.larc.nasa.gov
U.S. Mail: NASA "Why?" Files, Langley Research Center, Mail Stop 400-DL, Hampton, VA 23681
Fax: 757-864-9701
Telephone: 757-864-5044

What rights and responsibilities are associated with the NASA "Why?" Files?

The NASA "Why?" Files is a U.S. Government product and is not subject to copyright. There are no fees or licensing agreements. Broadcast and off-air rights are unlimited and granted in perpetuity.

How do I get a classroom mentor?

The American Institute of Aeronautics and Astronautics (AIAA) provides classroom mentors to assist educators. Every effort will be made to match an educator with an AIAA member who will assist the educators either in person or by E-mail. To request a mentor, e-mail nasawhyfiles@aiaa.org or call Lisa Bacon at (703) 264-7527 at least four weeks in advance.

What are the NASA "Why?" Files objectives?

Each program in the 2001-2002 NASA "Why?" Files series is designed to support the use of problem-based learning (PBL) to introduce students to scientific inquiry and to demonstrate the integration of mathematics, science, and technology while solving real world problems. The NASA "Why?" Files series can be easily integrated into an existing curriculum or used to introduce or reinforce a curriculum topic, objective, or skill.

The NASA "Why?" Files has four objectives:

1. The series will use problem-based learning to introduce students to scientific inquiry and the scientific method.
2. The series will give students the opportunity to simultaneously learn subject matter and develop problem-solving skills while engaged in real-world problems.
3. The series will demonstrate workplace mathematics, science, and technology as a collaborative process.
4. The series will raise students' awareness of careers and overcome stereotyped beliefs by presenting women and minorities in challenging careers.

What is the best way to use the NASA "Why?" Files?

For the most effective use of the NASA "Why?" Files, it is strongly recommended that the programs be videotaped from the broadcast prior to student viewing. The programs are designed to be viewed in 15-minute instructional segments.

The NASA "Why?" Files series introduces students to problem-based learning and scientific inquiry. It encourages the development of higher order cognitive skills and a more active mental engagement with the television broadcast. Following the recommended strategy in each guide enables students to make stronger connections between the television broadcast, the hands-on activities and experiments, the web site, and appropriate mathematics, science and technology concepts.

The guide includes suggestions for reflective discussion, student involvement, hands-on activities, experiments, journal writing, and web activities. The strategy promotes rich discourse among students. The proposed format is flexible and effective in enhancing students' understanding of complex mathematics, science, and technology concepts.

2001 – 2002 NASA "Why?" Files Programs

The Case of the Mysterious Red Light

Starts airing: Wed., Oct. 17, 2001, 11 a.m.- Noon ET

Have you ever seen an unusually bright red sunrise or sunset and wondered why? That's exactly what happens in *The Case of the Mysterious Red Light* as the tree house detectives accept the challenge of trying to find the source of the red light.

Math Standards: Numbers and Operations, Measurement, Problem Solving, and Representation

Science Standards: Unifying Concepts and Processing; Science and Inquiry; Physical Science; Earth and Space Science; Science and Technology; and Science in Personal and Social Perspective

Technology Standards: Basic Operations and Concepts; Social, Ethical, and Human Issues; Technology Productivity Tools; Technology Communication Tools; Technology Research Tools; and Technology Problem-Solving and Decision-Making Tools

Geography Standards: The World in Spatial Terms; Places and Regions; Physical Systems; Environment and Society; and the Uses of Geography

NASA Enterprise: Aerospace Technology, Earth Science

The Case of the Barking Dogs (R)

Starts airing: Wed., Nov. 14, 2001, 11 a.m.- Noon ET


Kali

the tree house detectives

The tree house detectives accept the challenge of determining why dogs in the surrounding neighborhoods have unexpectedly started barking in the morning and late at night. In determining the "why," the detectives learn about sound, what it is, how it is transmitted, and how humans and animals hear.

Math Standards: Numbers and Operations; Algebra; Geometry; Measurement; Data Collection and Analysis, Connections, and Representation

Science Standards: Unifying Concepts and Processing; Science and Inquiry; Physical Science; Life Science; Science and Technology; Science in Personal and Social Perspective; and History and Nature of Science

Technology Standards: Basic Operations and Concepts; Social, Ethical, and Human Issues; Technology Communication Tools; and Technology Research Tools

Geography Standards: The World in Spatial Terms

NASA Enterprise: Aerospace Technology

The Case of the "Wright" Invention

Starts airing: Wed., Dec. 5, 2001, 11 a.m.- Noon ET

Travel back in time with the tree house detectives to learn about the process of invention from two of the greatest inventors of all time, Orville and Wilbur Wright. As the tree house detectives try to create their own invention, they get expert help from the Wright brothers, NASA researchers, and other experts in the community. The tree house detectives find that inventing is not as easy as it seems, and it really does take the "Wright" stuff to be a good inventor.

Math Standards: Numbers and Operations; Measurement; Data Analysis and Probability; Problem Solving; Communication; and Representation

Science Standards: Unifying Concepts and Processing; Science and Inquiry; Physical Science; Science and Technology; Science in Personal and Social Perspective; and History and Nature of Science

Technology Standards: Basic Operations and Concepts; Social, Ethical, and Human Issues; Technology Productivity Tools; Technology Communication Tools; Technology Research Tools; and Technology Problem-Solving and Decision-Making Tools

***(R) indicates a repeat show from the 2000-2001 series**

Geography Standards: The World in Spatial Terms; Places and Regions; and Human Systems

NASA Enterprise: Aerospace Technology

The Case of the Electrical Mystery (R)

Starts airing: Wed., Jan. 16, 2002, 11 a.m.- Noon ET

The tree house detectives are baffled: "Why is the electricity on in the tree house but off in the houses across the street?" They accept the challenge to solve the problem. The detectives learn about electricity and how it is generated. They also learn about current, circuits, and distribution. In solving the case, they learn that the "electrical mystery" is not simply an "open" and "closed" case.

Math Standards: Numbers and Operations; Algebra, Measurement; Data Analysis and Probability; Problem Solving, Communication, Connections, and Representation

Science Standards: Unifying Concepts and Processing; Science and Inquiry; Physical Science; Earth and Space Science, Science and Technology; Science in Personal and Social Perspective; and History and Nature of Science

Technology Standards: Basic Operations and Concepts; Social, Ethical, and Human Issues; Technology Productivity Tools; Technology Communication Tools; Technology Research Tools; and Technology Problem-Solving and Decision-Making Tools

Geography Standards: The World in Spatial Terms; Environment and Society; and the Uses of Geography

NASA Enterprise: Aerospace Technology

The Case of the Inhabitable Habitat

Starts airing: Wed., Feb. 13, 2002, 11 a.m.- Noon ET

Students are invited to actively join the tree house detectives as they investigate the devastating changes that have occurred in the local fishing industry. The fish have disappeared! In solving this case, the tree house detectives learn about various habitats on land, in the water, and even in space. They learn about the animals that depend on these habitats and how changes created by both man and nature affect their existence. The tree house detectives determine that habits can have a big impact on habitats.

Math Standards: Numbers and Operations; Measurement; Data Analysis and Probability; Problem Solving; Communication; and Representation

Science Standards: Unifying Concepts and Processing; Science and Inquiry; Life Science; Earth and Space Science; Science and Technology; Science in Personal and Social Perspective; and History and Nature of Science

Technology Standards: Basic Operations and Concepts; Social, Ethical, and Human Issues; Technology Productivity Tools; Technology Communication Tools; Technology Research Tools; and Technology Problem-Solving and Decision-Making Tools

Geography Standards: The World in Spatial Terms; Places and Regions; Physical Systems; and Environment and Society.

NASA Enterprise: Aerospace Technology, Biological and Physical Research, Earth Science, and Human Exploration and Development of Space

The Case of the Challenging Flight (R)

Starts airing: Wed., Mar.13, 2002, 11 a.m.- Noon ET

The tree house detectives accept a challenge to compete in an "Egg-tra-ordinary" airplane contest. Our detectives design and build an airplane by using common household materials and learn about the four basic components of flight: lift, thrust, drag, and weight.

Math Standards: Numbers and Operations; Algebra, Measurement; Data Analysis and Probability; Problem Solving; Connections; and Representation

Science Standards: Unifying Concepts and Processing; Science and Inquiry; Physical Science; Life Science; Science and Technology; Science in

Personal and Social Perspective; and History and Nature of Science

Technology Standards: Basic Operations and Concepts; Social, Ethical, and Human Issues; Technology Productivity Tools; Technology Communication Tools; Technology Research Tools; and Technology Problem-Solving and Decision-Making Tools

Geography Standards: The World in Spatial Terms

NASA Enterprise: Aerospace Technology

The Case of the Phenomenal Weather

Starts airing: Wed., Apr. 10, 2002, 11 a.m.- Noon ET

Join the tree house detectives as they plan a trip to the Caribbean and encounter problems trying to predict the weather. In this case the tree house detectives will learn about violent storms such as hurricanes and tornadoes, weather fronts, global wind patterns, and climates. While solving the case, they will discover that predicting the weather is not predictable at all!

Math Standards: Numbers and Operations; Geometry; Measurement; Data Analysis and Probability; Problem Solving; Communication; and Representation

Science Standards: Unifying Concepts and Processing; Science and Inquiry; Life Science; Earth and Space Science; Science and Technology; Science in Personal and Social Perspective; and History and Nature of Science

Technology Standards: Basic Operations and Concepts; Social, Ethical, and Human Issues; Technology Productivity Tools; Technology Communication Tools; Technology Research Tools; and Technology Problem-Solving and Decision-Making Tools

Geography Standards: The World in Spatial Terms; Places and Regions; Physical Systems; Human Systems; and Environment and Society.

NASA Enterprise: Aerospace Technology, Earth Science

NASA Resources for Educators

NASA's Education Home Page **(http://education.nasa.gov)** serves as the cyber-gateway to information regarding educational programs and services offered by NASA for educators and students across the United States and provides specific details and points of contact for all of NASA's educational efforts and Field Center Offices. Those using the site will have access to a comprehensive overview of NASA's educational programs and services, as well as home pages offered by NASA's four areas of research and development.

NASA Langley Research Center, Office of Education **(http://edu.larc.nasa.gov)** offers a wide variety of opportunities for educators at all levels of instruction. The Office of Education seeks to enhance the teaching of mathematics, science, and technology through its distance learning programs, all of which are described on the web site. Educators can also search NASA educational resources for the classroom, including activities, curriculum-enhancing projects, and equipment. From this site, you can link to our NASA CONNECT web site.

NASA Spacelink **(http://spacelink.nasa.gov)** is one of NASA's electronic resources that is specifically developed for use by the education community. This comprehensive electronic library offers teacher guides, wall sheets, listings of videos, computer software, and other materials that have been developed to meet national education standards. Educators can search specific curriculum materials by grade level and subject matter. Current and historical information related to NASA's aeronautic and space research can be found on Spacelink. Links to NASA Educator Resource Centers (ERCs), the Central Operations of Resources for Educators (CORE), news releases, current state reports on agency projects and events, and television broadcast schedules for NASA Television are also provided.

Quest **(http://quest.nasa.gov)** is the home of NASA's K-12 internet initiative. This electronic resource specializes in providing programs, materials, and opportunities for teachers and students to use NASA resources as learning tools to explore the Internet. One of its unique projects is Sharing NASA, a series about on-line, interactive units where students can communicate with NASA scientists and researchers to experience the excitement of real science in real time.

The Learning Technologies Channel (LTC) **(http://quest.nasa.gov/ltc/)** is a NASA location on the Internet that allows you to participate in on-line courses and to remotely attend some NASA workshops and seminars. A primary focus of the LTC is to broaden the uses of the Internet to include in-service teacher training and to bring new internet experiences into the classroom.

NASAexplores **(http://NASAexplores.com/)** provides science, mathematics, and technology lessons that are published weekly. NASAexplores gives teachers timely educational content based on current research, development, and related events. The web site provides an e-mail subscriber list service to notify subscribers of weekly content. Teachers sign up to receive e-mail notices linking them directly to the web site where the lessons, along with related resources and materials, are posted. Teachers without e-mail can also access the lessons by visiting the NASAexplores web site.

NASA CORE, Central Operation of Resources for Educators **(http://core.nasa.gov)** is a worldwide distribution center for NASA multimedia educational materials. Educational materials include videotape programs, slide sets, and computer software. For a minimal fee, NASA CORE will provide educators with materials through its mail order service. A free NASA CORE catalog is available.

NASA CORE
15181 State Route 58 South, Oberlin, OH 44074,
phone: (440) 775-1400, fax: (440) 775-1460,
E-mail: nasaco@leeca.org

The NASA Educator Resource Center Network (ERCN) is composed of Educator Resource Centers (ERCs) located on or near all NASA field centers, colleges, museums, or other nonprofit organizations. These centers provide educators with inservice and preservice training, demonstrations, and access to NASA instructional products.

For a list of ERCs in your state, visit the NASA Educator Resource Center Network, **http://education.nasa.gov/ercn**. Educators may also contact one of the ERCs at the following NASA Centers.

AK, Northern CA (southern-most counties of Inyo, Kings, Monterey, Tulare), HI, ID, MT, NV, OR, UT, WA, WY
NASA Ames Educator Resource Center
Mail Stop 253-2
Moffett Field, CA 94035-1000
(650) 604-3574
http://amesnews.arc.nasa.gov/erc/erchome.html

AZ, Southern CA (northern-most counties of Kern, San Bernadino, San Luis Obispo)
NASA Dryden Educator Resource Center
45108 North Third Street East
Lancaster, CA 93535
(661) 948-7347
http://www.dfrc.nasa.gov/trc/ERC

CA
NASA JPL Educator Resource Center
Village at Indian Hills Mall
1460 East Holt Blvd., Suite 20
Pomona, CA 91767
(909) 397-4420
http://eis.jpl.nasa.gov/eao/

CT, DE, DC, ME, MD, MA, NH, NJ, NY, PA, RI, VT
NASA Goddard Educator Resource Center
Mail Code 130.3
Greenbelt, MD 20771
(301) 286-8570
http://pao.gsfc.nasa.gov/gsfc/educ/trl/welcome.html

VA's and MD's Eastern Shore
NASA Wallops Educator Resource Center
Education Complex - Visitor Center
Building J-17
Wallops Island, VA 23337
(757) 824-2298
http://www.wff.nasa.gov/pages/visitor.html

FL, GA, Puerto Rico, Virgin Islands
NASA Kennedy Educator Resource Center
Mail Code ERC
J.F. Kennedy Space Center, FL 32899
(321) 867-4090
http://www-pao.ksc.nasa.gov/kscpao/educate/edu.htm

CO, KS, NE, NM, ND, OK, SD, TX
Johnson Space Center
1601 NASA Road One
Houston, TX 77058
(281) 244-2129
http://www.spacecenter.org/educator_resource.html

KY, NC, SC, VA, WV
NASA Langley Educator Resource Center
Virginia Air and Space Center
600 Settlers Landing Road
Hampton, VA 23669
(757) 727-0900, ext. 757
http://www.vasc.org/erc

IL, IN, MI, MN, OH, WI
NASA Glenn Educator Resource Center
21000 Brookpark Road, MS 8-1
Cleveland, OH 44135
(216) 433-2017
http://www.grc.nasa.gov/WWW/PAO/html/edteachr.htm

AL, AR, IA, LA, MO, TN
NASA Marshall Educator Resource Center
U.S. Space and Rocket Center
One Tranquility Base
Huntsville, AL 35807
(256) 544-5812
http://erc.msfc.nasa.gov

MS
NASA Stennis Educator Resource Center
Building 1200
Stennis Space Center, MS 39529
(228) 688-3338
http://education.ssc.nasa.gov/htmls/trc/trc.htm